Representative Task # 2

Crustal Dynamics Data Information System (based on 4.2)

For the purposes of costing, assume that this Representative Task runs from Years 1 thru 4 of the contract.

Background

The contractor shall support the Crustal Dynamics Data Information System (CDDIS), managed by the Solar System Exploration Data Services Office, Code 690.1.

The CDDIS staff is tasked to assist international researchers with their space geodesy and geodynamics data requirements. The data services of the CDDIS consist primarily of receiving, archiving, and providing on-line access to space geodesy, geodynamics, and geophysics-related data, products, and information as well as cataloging these incoming files in the CDDIS database. The CDDIS is responsible for the dissemination of the data, products, and information to NASA investigators and international scientists participating in global space geodesy programs.

The CDDIS operationally supports many international programs such as the International GNSS Service (IGS) and its working groups and pilot projects, the International Laser Ranging Service (ILRS), the International VLBI Service for Geodesy and Astrometry (IVS), the International DORIS Service (IDS), the International Earth Rotation and Reference Systems Service (IERS), and the Global Geodetic Observing System (GGOS). The support of these program and projects requires timely availability of data holdings, within minutes to hours of receipt.

The CDDIS is funded through NASA's Earth Observation System Data and Information System (EOSDIS) program and thus satisfies various requirements of its data centers. These activities include providing a subset of the CDDIS data holdings metadata to the EOS Clearinghouse (ECHO) and the Global Change Master Directory (GCMD) as well as providing metrics on data ingest and distribution to the EOSDIS metrics system (EMS).

The data processing efforts, including verification, reformatting, and distribution, will be performed on the CDDIS servers. These processes include special programs to read received files, validate and summarize their contents, reformat the data (if required), and archive the files to the appropriate disk area and backup media (if required). The CDDIS is operational on a distributed Dell Linux/Apple Xserve environment.

Technical Requirements

The contractor shall:

1. Provide data, products, and information to the space geodesy user community on a routine and timely basis. These files include GNSS (GPS and GLONASS currently; Galileo and Compass in the future) data, satellite and lunar laser ranging (SLR and LLR) data, VLBI data base experiments, DORIS data, products derived from these data, and information about these data and products.

2. Provide support to space geodesy user community in accessing CDDIS online archive and provide support for special requests (~three requests per week).

3. Process all GNSS data (observation, navigation, meteorological files) received via network transmission, including data compression and decompression where required, data formatting to RINEX if necessary, data archiving to on-line disk areas, quality checking, data summarization, and loading of summary information into CDDIS database. Data must be made available to the user community through automated processing in a timely fashion (within an hour of receipt for daily data files and five minutes for hourly and high-rate data files). Ensure latest version of UNAVCO's teqc software is utilized for data QC and summarization. Generate Data Holdings Files (DHFs) of current GNSS data for the GPS Seamless Archive Center (GSAC) program on a daily basis. Load summary information files into database.

4. Process all SLR data (full-rate, normal points) received from cooperating institutions and the NASA SLR support contractor. Maintain daily normal point and full-rate SLR data files and incorporate these data into monthly files. Load summary files into database.

5. Process all DORIS data and generate summaries; load summary files into database.

6. Coordinate with IVS personnel in archiving VLBI data and products; load summary information into database.

7. Process any new data and products received for archive in CDDIS as required. Provide data quality and summary information for all data processed.

8. Continue development and implementation of recommendations for modifications to CDDIS metadata by coordinating with EOSDIS and ECHO to permit inclusion of CDDIS metadata in ECHO. Also coordinate CDDIS metadata implementation with GGOS portal requirements. Review current accepted standards for metadata to align CDDIS metadata with these standards.

9. Develop enhancements to CDDIS web presence by creating tools for searching the metadata extracted from the incoming data and product files processed for the CDDIS online archive. These enhancements should aid both expert and new users

in discovering CDDIS data holdings through spatial, temporal, and parameter searches.

10. Develop and implement redesign of the International Laser Ranging Service (ILRS) web presence using NASA standards as appropriate. Populate new design from existing web pages and enhance as needed.

11. Validate submitted data products. Load data and summary information into the CDDIS MySQL database. Provide ingest and distribution metrics to EMS.

12. Maintain the data archiving and processing software on the Linux servers. Maintain all software used to generate and verify CDDIS data products. Incorporate enhancement software as required. Develop and document any new automated routines to support the timely archiving and distribution of data sets in the archive. Provide programs for the reformatting and analysis of data products as required.

13. Maintain and verify the CDDIS database using query language and utilities of the MySQL database software.

14. Generate regular (e.g., quarterly) reports for CDDIS data management and users describing the data activity of the project.

15. Document all programs, procedures, and CDDIS system activities. Revise and enhance the CDDIS Standard Operating Procedures (SOP) manual yearly to contain up-to-date instructions for tasks performed by the CDDIS support staff.